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(REV 10-94)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEYS DOCKET NUMBER

18390.4

U.S. APPLICATION NO

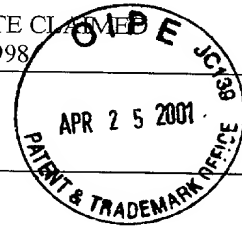
09/830299

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US).  
CONCERNING A FILING UNDER 35 U.S.C. 371**INTERNATIONAL APPLICATION NO.  
PCT/EP99/08078INTERNATIONAL FILING DATE  
October 26, 1999PRIORITY DATE CLAIMED  
October 26, 1998

TITLE OF INVENTION: INTERACTIVE FILM REPRODUCTION

APPLICANT(S) FOR DO/EO/US

SHAW, Jeffrey



Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I)
4. ☒ A proper Demand for International Preliminary Examination was made by the 19<sup>th</sup> month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C.371(c)(2)).
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C.371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C.371(c)(3)).
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C.371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C.371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C.371(c)(5)).

**Items 11. to 16. below concern document(s) or information included:**

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
  1. Form PCT/IB/308
  2. Return Postcard
  3. Conditional Petition to Revoke

09/830299

INTERNATIONAL APPLICATION NO.  
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17. The following fees are submitted:

## BASIC NATIONAL FEE (37 CFR 1.492 (a) (1)-(5)):

Search Report has been prepared by the EPO or JPO..... \$ 860.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
.....\$690.00No international preliminary examination fee paid to USPTO (37 CFR 1.482)  
but international search fee paid to USPTO (37 CFR 1.445(a)(2)).....\$710.00Neither international preliminary examination fee (37 CFR 1.482) nor  
international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....\$1000.00International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(2)-(4).....\$100.00**ENTER APPROPRIATE BASIC FEE AMOUNT =**Surcharge of \$130.00 for furnishing the oath or declaration later than 20 30  
months from the earliest claimed priority date (37 CFR 1.492(e))

CLAIMS NUMBER FILED NUMBER EXTRA RATE

Total claims 27 - 20 = 7 X \$ 18 00

Independent claims 4 - 3 = 1 X \$ 80.00

MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$ 270

**TOTAL OF ABOVE CALCULATIONS =**

Reduction by 1/2 for filing by small entity, if applicable.

**SUBTOTAL =**Processing fee of \$130.00 for furnishing the English translation later than 20 30  
months from the earliest claimed priority date (37 CFR 1.492(f)). +**TOTAL NATIONAL FEE =**Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property**TOTAL FEES ENCLOSED =**Amount to be:  
refunded \$  
charged \$a.    A check in the amount of \$                      to cover the above fees is enclosed.b. X Please charge my Deposit Account No. 50-0698 in the amount of \$ 1106 to cover the above fees.c. X The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 50-0698. A duplicate copy of this sheet is enclosed.**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b))  
must be filed and granted to restore the application to pending status.Please send all correspondence  
by AIRMAIL  
to:Dr. Paul J. Vincent  
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Fed. Rep. of Germany

SIGNATURE.

Dr. Paul J. Vincent

NAME

37,461

REGISTRATION NUMBER

18390.4

Translation of PCT/EP99/08078 as filed on October 26, 1999

### Interactive Film Reproduction

There have been various suggestions for providing users with interactive film or program replay. It has been proposed e.g. to provide a film with a happy or sad ending and to allow the viewers in the cinema to decide by majority which content the film is to have such that all cinema visitors see either the happy or sad ending.

It is moreover known to record an event, e.g. a car race, using many different cameras, e.g. cameras outside of the track and cameras which are disposed in the cockpits of the respective race drivers. The respective camera images are transferred simultaneously to the TV receivers - e.g. the digital TV DF1 - and the viewer can select, from a plurality of possible camera settings, the one which he/she prefers at the moment, e.g. the camera in the cockpit of Michael Schumacher.

Finally, it has been proposed that the platform in a 3D cinema on which the viewer stands or sits, is movable with the motion being controlled by the replayed film content.

The "Zentrum für Kunst und Medientechnologie Karlsruhe (ZKM)" has furthermore proposed, in an inflatable hemisphere in

which a 3D projection system is installed, displacement of the projected image to any position on the inside of the hemisphere. The position of the image is thereby linked to the head movement of a visitor and follows his/her viewing direction. In contrast to e.g. cinema or TV with which image reproduction is always limited to a certain individual location, namely, a section of the cinema screen or TV screen, the above mentioned method of 3D projection displaces an image within the hemisphere to a location which the observer currently views.

It is moreover known to use the above-described 3D projection system within a hemisphere for virtual travel through a reconstructed landscape. Through selecting (clicking on) certain image units, the viewer himself can determine his/her own "walk", while he/she does not actually move and always remains at the same location.

It is the purpose of the present invention to provide an interactive film perception which is inexpensive, attractive and which preferably permits the viewer to simultaneously be director and camera man during replay of the film.

The object in accordance with the invention is achieved by a method in accordance with claim 1. Advantageous further developments are described in the dependent claims.

The invention is based on the following considerations: A person lives in a three-dimensional environment and, in

reality, always senses (at least partly) even those things which are outside of his field of vision or which he/she can sense less sharply. A simple example is the driver of a car who drives on a road with his eyes directed forward. If a following driver sounds the horn, the preceding driver will hear that sound. He/she thereby senses what is behind him/her and outside of his/her field of vision and will immediately look (into the rear mirror) to see what is going on behind him/her to draw the associated conclusions. Just as a look into the rear view mirror shows only a small window of what is going on behind the driver without the driver being able to recognize what is happening outside of the mirrored surface, a preferred embodiment of the invention provides that only a film section - also called a window - of the entire film is visible while all other parts of the film outside of the window are not replayed or are darkened and are therefore not or only barely visible. The movement of the window permits the viewer to see all parts of the film, however, not at the same time. The "viewing window", i.e. the visible film section has e.g. a length-side-ratio of 4 to 3, 16 to 9, or any other shape.

In the cinema and on TV and in all known replay forms of moving images, the viewer is always presented with only a narrow camera section (irrespective of whether the camera is stationary or movable), wherein the camera section has a regular width such that it can largely be detected by the field of vision and thus the reception capacity of a person. In contrast to the three-dimensional perception of a person

in his/her surroundings, the usual film and TV replay is directed to one single dimension. Even if the user can select different camera positions, this only results in multiplication of one dimension without providing a three-dimensional sensation which is close to reality.

Finally, the invention is based on the finding that visual perception depends largely on orientation and, vice versa, that the visual sense also influences sensing of acoustical information.

In a movie, the offered images are usually matched to sounds also describing the image, with the exception of background sound, e.g. film music, to influence the mood of the film. If there is a noise in a film which is not matched to the image content shown, the camera will usually move immediately after that sound to the possible source of the sound such that the viewer gains a visual explanation for the preceding sound.

In the above-mentioned film replays, the viewer is largely bound to the camera work and does not know what is happening outside of the section recorded by the camera.

The invention describes a new interactive form of film replay and sensation wherein the viewer and perceiver is offered an image which is larger than his/her field of vision. Although the field of vision of a person is theoretically  $180^\circ$ , actual perception is, however, limited to a field of vision which is considerably less than the theoretical, e.g.  $70^\circ$ . Since a

person can move his/her body and head to direct his/her field of vision towards any point of the surroundings, no handicap results rather advantages, since the human brain must only process that visual information present in the central vision field.

The invention furthermore provides that the viewer is coupled to an orientation unit which detects the viewing direction of the observer. If the viewer watches an individual scene of a film consisting of panoramic scenes, the audio and/or visual reproduction of this scene is emphasized compared to the other scenes. Such emphasis may e.g. be realized by replaying acoustical information from the viewed scene in a louder or clearer manner than from the other scenes which are not currently being viewed or which are not visibly replayed. One individual scene can also be emphasized by enlarged replay of the viewed scene compared to the other scenes or with e.g. higher resolution and sharpness of the viewed scene compared to the other scenes not currently observed by the viewer. In particular, the audio information from the scenes outside of the viewing direction of the viewer is not completely suppressed but can be perceived more or less clearly by the viewer.

The invention permits a sensing of the film which is close to reality. An additional particular advantage of the invention is the creation of a completely new type of cinema, wherein the user, at first viewing, can only see parts of the entire film and two viewers could have completely different opinions

about the film, since they have seen and heard completely different portions of the entire film.

In a particularly preferred fashion, the invention can be perceived in a 3D projection system of a hemisphere or full sphere. The image recorded from only one camera location can be replayed onto the inner surface of the hemisphere using a 3D projection system. If a corresponding section from the surroundings has been recorded with the camera - i.e. not only the usual narrow camera section but all views which can be detected from the camera location - the viewer is simultaneously offered many more scenes, in one single image, than he can theoretically (visibly) see, since the field of vision of the observer is considerably smaller than the overall replay surface. This observer burden is further increased by simultaneously replaying several different scenes, wherein the viewer is usually accustomed to concentrating on only one scene and cannot completely detect and digest the other scenes. When the viewer looks at a certain scene, the replay device is informed thereof by the viewing direction orientation unit and the audio information which belongs to that currently viewed scene can be sensed and is cognizant to the viewer. At the same time, the audio information of other scenes is not completely faded out but somewhat suppressed (as in real perception) such that the observer still notices that something else is going on somewhere else in the film, but is not completely cognizant of the film scene not viewed.



In addition to known sound reproduction devices, such as headphones and loudspeakers, sound reproduction devices are also suitable for an acoustical perception close to reality as are known e.g. from WO97/41709. This sound reproduction device is particularly preferred since sound perception includes the body sound functions and, in contrast to a loudspeaker system, several users can have different sound perception in one room at the same time and without mutual disturbance should e.g. neighboring viewers look at different film scenes. Further advantages of the invention can be extracted from the following exemplary description of the figures:

Fig. 1 shows a view of a scene example;

Fig. 2 shows a planar representation of scene 1;

Fig. 3 shows a scene representation alternative to that of Fig. 1;

Fig. 4 shows a cross-section through an inventive cinema;

Fig. 5 shows a view of a replay of an inventive film;

Fig. 6 shows a view from above of an inventive cinema arrangement.

Fig. 1 is a top view of a constructed panoramic film scenery 1, wherein the entire scene is composed of several scene

sections. The first scene section 2 is a road on which a car is travelling. The second scene section 3 is a small group of trees (park-like grounds) with a dog walking and barking. The third scene section 4 is a small pond with quacking ducks looking for food. The fourth scene section 5 is a playground with several loudly playing children. The entire scenery is illuminated by the sun at location 6. All scene sections have exactly the same light conditions and the same sun light impinging angle. All film scenes are recorded in total by a camera 7 at the camera location 8. The camera device 7 records the entire film scenery, i.e. a maximum of a  $360^\circ$ , round view. In addition to the optical recording, the respective sounds which belong to a scene are recorded, with the recording being carried out such that an optical scene is associated with the associated sound during recording.

Fig. 2 shows the replay of the scene shown in Fig. 1 in planar elevation between 0 and  $360^\circ$  (in the horizontal and vertical direction). Shown, from the left part of the replay to the right edge of the replay screen, are the car scene 1, then the tree scene 2, then the pond scene 4 and then the playground scene 5. The planar replay shows a section G which characterizes the area which is usually visible to the human eye (field of vision). It is to be understood that this section G always moves with the eyes of the viewer. If the viewer looks at the car scene, he/she will clearly hear the sound of the passing car, and may also simultaneously hear sounds from other scenes. The sounds from the other scenes are replayed with a lower volume and less clarity to allow

the viewer to experience the film in a manner which is as close as possible to real perception. A person standing at location 8 of the camera 7, and looking at the road, would also hear the sound of the other scene sections without being able to perceive them with full optical clarity. This experience is also possible with the inventive replay shown in Fig. 2.

Fig. 4 shows a cross-section of a view onto a closed circular surface of a hemisphere constituting the cinema screen. The viewer is in the center of the cinema and directs his/her eyes towards the film scene 2 - a road with a passing car. The viewer wears headphones or a sound reproduction device which can be disposed on the head of the viewer, as disclosed e.g. in WO97/41709. Moreover, a signal transmitter, e.g. a magnetic field generator or a device for generating an electromagnetic wave (e.g. an (infrared) light/laser source) is disposed on the headphones, on the sound reproducing device, or at another location on the viewer's head. A uniquely directed signal 23 is transmitted by the signal transmitter, e.g. an oriented magnetic field or an oriented light beam, wherein the direction of the signal corresponds to the head orientation/viewing direction of the cinema visitor (viewer). This can be achieved by disposing the signal emitter (mounting) on the head of the user or on the headphones in an unambiguous fashion.

A signal receiving device 24 is also provided which can detect the signal 3 or the direction of the signal. If the

signal transmitter is a magnetic field generator, the receiving device can determine the direction of the magnetic field of the magnetic field generator. If the signal transmitter is an infrared laser light source, the receiving device may be a corresponding camera device by means of which the direction of the laser light source can be received (infrared is invisible to humans). The receiving device can also be movable, or be stationarily disposed in the cinema such that it is not visible to the viewer.

The direction of the signal (e.g.  $10^\circ$ ) from the signal transmitter is determined by the receiving device 24 and, depending on the result, the replay is influenced in the above-described fashion such that e.g. noises which belong to the car scene 2 viewed are reproduced at a higher volume than noises from other scenes not currently observed by the viewer.

In addition to the direction of the transmitted signal from the signal transmitter, the receiving device may also determine the exact location of viewing. If the viewing location is not in the foreground of the film scene but rather in the background, the background will also be given sharp contrast and/or be enlarged (PAN/-Zoom) as much as possible such that the viewer can perceive not only a two-dimensional but a real three-dimensional image.

If the car scene shows e.g. a mother walking with her child on the pavement behind the road (Fig. 1), and the viewer

directs his/her view onto this lower section of the scene, he/she will perceive what the mother says to her child or can recognize the person and her clothes as exactly and sharply as possible.

Fig. 3 shows a view of scene other than that of Fig. 1. The scene shown in Fig. 3 is a restaurant with many tables, a restaurant entrance, a counter (bar), a cabaret stage and a bordering kitchen. The camera location is again characterized with position 8 and the camera 7 records the entire surrounding scene. A couple is seated at table T1, three friends sit around table T2, a member of the board of a company sits at table T3, four bowling companions sit at table T4, a family with a child sits at table T5, at table T6 is a group from regulars of a students association, an attorney and his clients sit at table T7, at table T8 is a children's birthday party, at table T9 are three criminals planning a bank robbery and the last table T10 is occupied by a group of politicians. The bartender at the counter prepares the ordered drinks and individual persons leave or enter the room through the entrance, from which street noises can be heard. The table arrangement suggests that every individual table has different topics for discussion. If, after several minutes of this recording, there is an explosion in the kitchen, all people in the restaurant will look in the direction of the kitchen, and each individual could perceive or interpret the explosion differently. The camera simultaneously detects all conversations and reactions at all tables and one can imagine that this panoramic film recorded

by the camera must be replayed several times to see all scenes and to digest their content.

When recording the film scene, the respective optical impressions of an individual table are associated with the respective acoustical information of that table such that, during replay, a corresponding amplification of the audio information is possible through replay of other acoustical information from other tables. All optical or acoustical information can also be initially associated with directional information (e.g. in degrees) to audio-visually emphasize one scene section compared to other scene sections during replay.

Since every single table effectively represents an individual film, the viewer may have to see the same film at least ten times in order to experience the entire film, while concentrating on different tables each time. It is thereby particularly interesting to watch the different reactions to the explosion in the kitchen at the various tables, which permits interesting character studies.

Fig. 5 shows a planar view of a screen with a visible section of the film shown as rectangular window. A light spot in the center of the window comes from a laser (laser pointer) which is mounted to the head of the user such that the direction of the laser approximately coincides with the viewing direction. The visible film section SA ( $SA_H$ ,  $SA_V$ ) is generated by a projector and a camera is mechanically and/or electronically coupled to the projector to detect the light spot. If the

viewer changes the viewing angle, the position of the light spot also changes. The camera follows the light spot and causes, through control of the projector, the visible section window of the film to be displaced in the direction of the light spot until the light spot is preferably once more within the visible film section. Displacement of the section also changes the film content which always depends on that content which is to be replayed at the current sectional position.

In general, there are several ways in which the visible section (the visible window) of the film can be moved. The film projection device can e.g. track until the light spot is centrally located in the window or within a certain central region of the window (to avoid constant movement of the window). It is also possible to displace the window until it has approached a certain separation from the light spot. It may furthermore be advantageous to prevent window movement if the light spot is outside of the camera section KA. Alternatively, the window can move in the direction in which the light spot has left the camera section KA.

Advantageously, the camera section KA, i.e. the horizontal and vertical camera section  $KA_H$  and  $KA_V$ , is larger than the window section such that the camera can follow the light spot even when it is already outside of the window section SA.

Fig. 6 shows a cinema arrangement from above, wherein the cinema screen has a cross section of a full or partial circle

40. A projector 41 is located at a central position in the cinema and projects the sectional window 42 of the movie which is to be viewed onto the screen 40. The width of the visible film section (window width) is characterized by  $SA_H$ . Moreover, there is a camera 43 above or below the projector or at another location in the cinema which records a relatively large camera section  $KA_v$ , wherein the visible film section lies within the camera section. If the film viewer, who carries an optical signal transmitter (see description of figure 4), looks at the observed film section 42, a light spot 44 will appear in the center of the film section. This light spot is detected by the camera 43 and the camera 43 tries to substantially follow all movements of the light spot. The camera 43 controls the projector 41, disposed on the movable platform, such that when the light spot is displaced, the visible film section is also displaced and the film content simultaneously changes. The viewer is thus both camera man and film director.



## Claims

1. Method for interactive audio/visual reproduction of a film including several scenes, whose width and/or height is larger than that of the visible section (SA) of the film during replay, wherein the viewer controls the position of the visible section within the dimensions of the entire film, and during audio reproduction of the film, audio information is also replayed which does not belong to the visible section.
2. Method according to claim 1, characterized in that the replay of audio information which belongs to the visible film section is emphasized, e.g. amplified, over replay of other audio information.
3. Method according to any one of the preceding claims, characterized in that the position of the replayed section of the film depends on the viewing direction of the viewer.
4. Method for interactive replay of a panoramic film, in particular in accordance with any one of the preceding claims, whose width and/or height ( $0^{\circ}$ - $360^{\circ}$ ) is larger than the usual visual section viewed by the human eye (20), wherein an orientation unit (23,24) detects which section (G) of the film is currently viewed by the viewer and replay of the viewed film section is emphasized in an audio and/or visual manner compared to replay of other

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5. Method according to claim 4, characterized in that the visual emphasis is realized by a replay window / section and that the film sections outside of the window are not replayed or are barely visible.
6. Method according to claim 5, characterized in that the shape of the replayed section is a square, round or any differently shaped window.
7. Method according to any one of the preceding claims, wherein the film is replayed on a screen which surrounds the observer through up to 360° in the vertical and horizontal directions.
8. Method according to any one of the preceding claims, characterized in that individual scenes (2,3,4,5) of the panoramic film are recorded from one single camera position (7) and the film recording device (8) can record a range about the camera location of up to 360°.
9. Method according to any one of the preceding claims, characterized in that the orientation unit (23,24) consists of two units, the first (23) of which emits a signal and the second (24) of which receives the emitted signal and evaluates therefrom the direction of orientation of the first signal, and the determined

direction signal is used to control emphasis of the reproduction of the viewed panoramic section.

10. Method according to any one of the preceding claims, characterized in that the orientation unit (23,24) is mounted to the head and/or to an acoustical reproduction device (21), e.g. headphones worn by the viewer.
11. Method according to any one of the preceding claims, characterized in that the orientation unit (23,24) consists of a magnetic field generator and a magnetic field measuring device, wherein the magnetic field measuring device determines the orientation of the magnetic field generated by the magnetic field generator.
12. Method according to any one of the preceding claims, characterized in that the orientation unit (23,24) comprises means for generating an electromagnetic wave or a light wave, in particular in the non-visible region, e.g. infrared, and further comprises means for receiving the generated electromagnetic wave or light wave and for evaluating the radiative direction of the electromagnetic or light wave.
13. Method according to claim 11, characterized in that the means for generating an electromagnetic wave is an infrared laser and the means for recording the electromagnetic wave consists of a camera which can

detect the infrared light spot impinging on the screen and which can follow its changing direction.

14. Method according to any one of the preceding claims, characterized in that, when several persons watch the panoramic film, each person is provided with his/her own orientation unit.
15. Method according to any one of the preceding claims, characterized in that emphasis of the replay of the viewed panoramic section is achieved in that acoustical information which belongs to the viewed panoramic section is more amplified during replay than acoustical information which does not belong to the viewed panoramic section.
16. Method according to any one of the preceding claims, characterized in that visual emphasis of the viewed panoramic section is achieved during replay in that the viewed panoramic section is replayed on the screen with the highest possible sharpness.
17. Method according to any one of the preceding claims, characterized in that for replay of the film, a projector is provided which is mechanically and/or electronically coupled with and/or controlled by part of the orientation unit for detecting the viewing direction.

18. Method according to any one of the preceding claims, characterized by means carried by the user which emit a light beam for transmitting a signal, wherein the recording/camera unit of the orientation unit detects the emitted light beam or a reflection thereof and controls the projector such that the light beam or a light spot of the light beam is centered on the replayed film section.
19. Method according to any one of the preceding claims, characterized in that the position of the visible section is determined through superposition of several individual light spots/light beams emitted from different positions of users.
20. Method according to any one of the preceding claims, characterized in that several orientation units are provided by means of which a majority decision is made about the visible section by constructing a geometric average of directions determined by all orientation units.
21. Method according to any one of the preceding claims, characterized in that the shape and/or size of the visible film section can be individually adjusted.
22. Method according to any one of the preceding claims, characterized in that the visible film section is controlled by a computer.

23. Film reproduction unit for carrying out the method according to any one of the preceding claims for replaying a panoramic film whose film width is broader than the usual visual viewing field of the human eye, wherein an orientation unit is associated with the perceiver (viewer) of the film which determines information about which film panoramic section the viewer is currently viewing and the film replay unit comprises means which can be controlled by the orientation unit such that replay of the viewed panoramic film section can be emphasized in an audio and/or visual manner compared to replay of other panoramic film sections.
24. Cinema comprising a film replay unit for carrying out the method according to any one of the preceding claims.
25. Cinema according to claim 24, wherein a hemispherical or spherical dome is provided as a projection surface to permit panoramic film replay up to  $360^{\circ}$  (in all directions).
26. Cinema according to claim 24 or 25, wherein each visitor wears one individual sound replay unit, e.g. headphones.
27. Method for the production of a panoramic film, wherein a camera means records an image which is considerably larger than the usual visual viewing section and which can be detected by the human eye with sufficient sharpness, wherein the camera associates directional

information with acoustical signals which are associated with a certain scene of the film panorama.

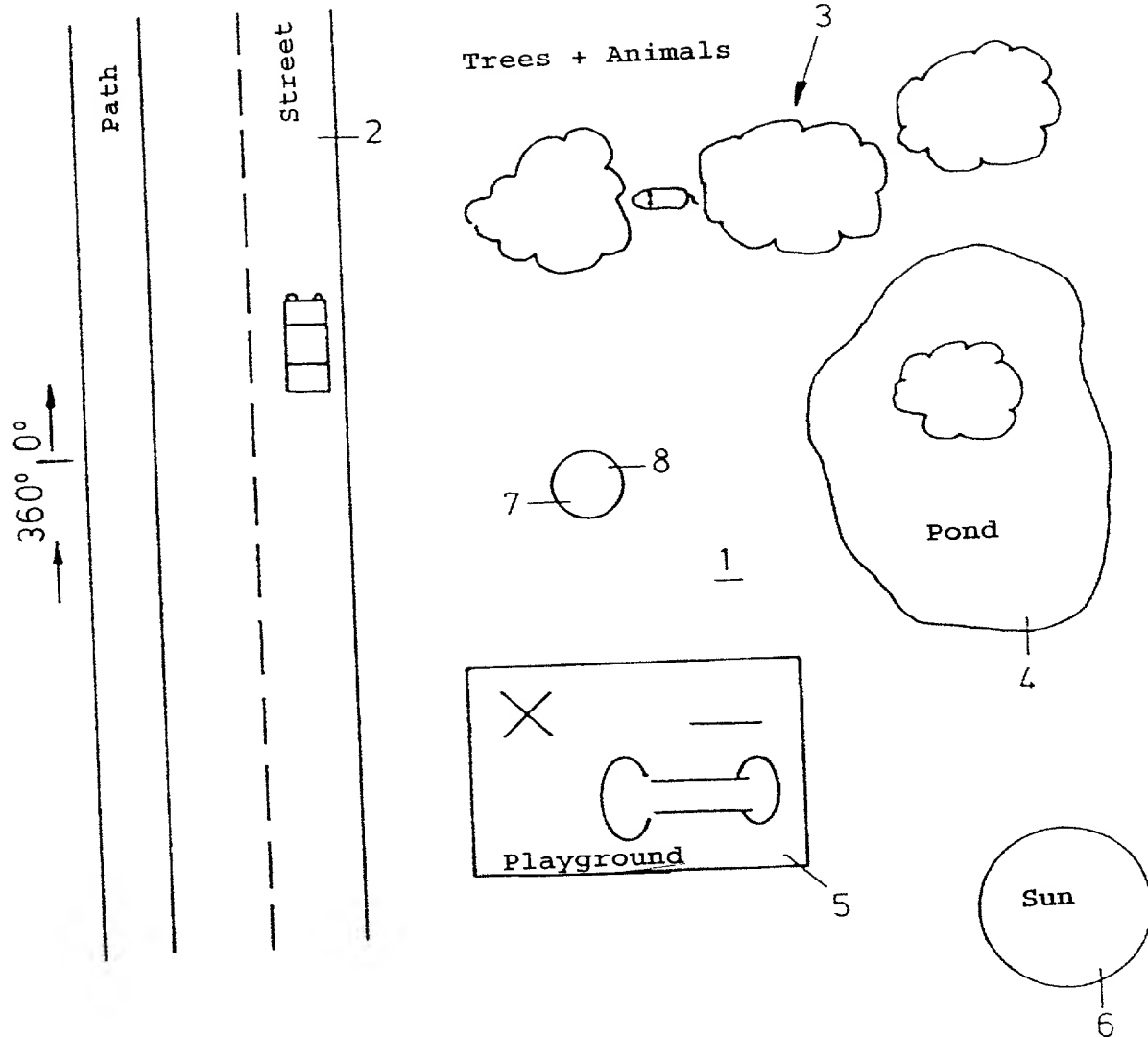
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The invention relates to a method for interactive audio/visual reproduction of a film with several scenes (2-5), the width and/or height of which is larger than the visible section (SA) of the film when the film is replayed. The viewer controls the position of the visible section within the dimensions of the entire film. During replay of the film, audio information is also replayed that does not belong to the visible section.



1/6

90°



270°

FIG. 1

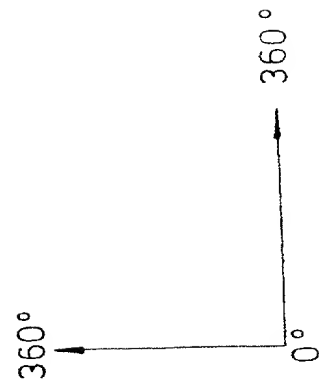
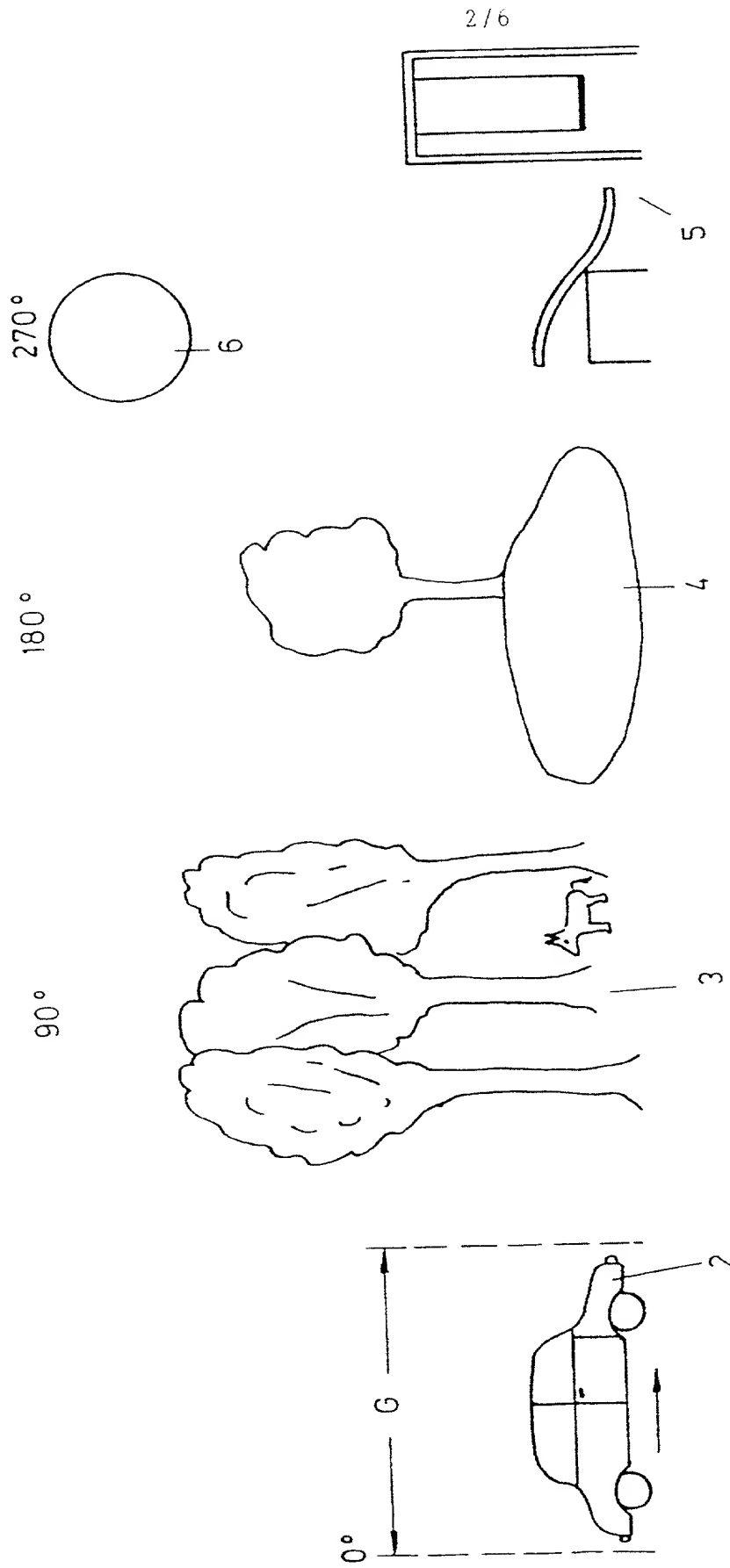


FIG. 2

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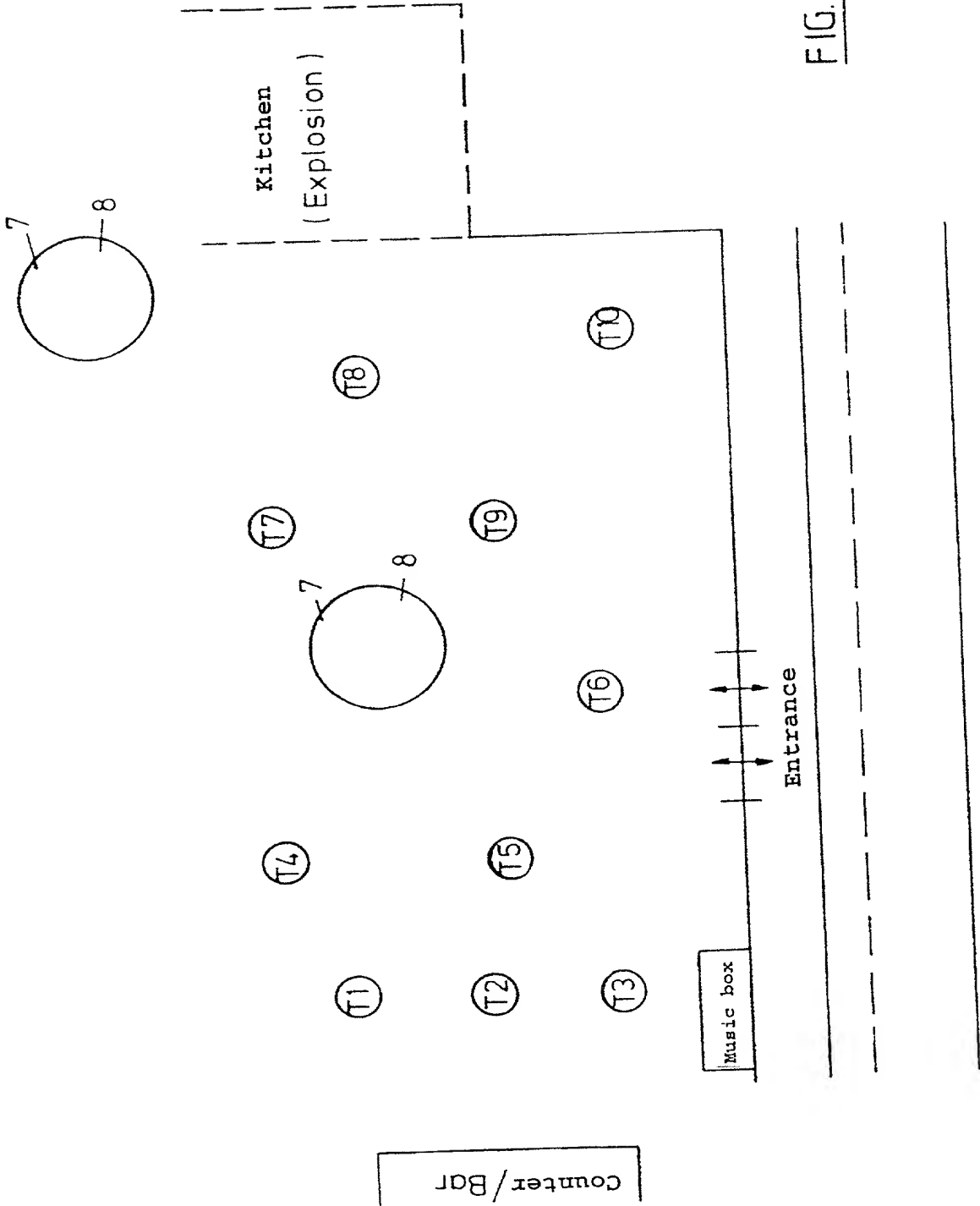


FIG. 3

1105240" 65200360

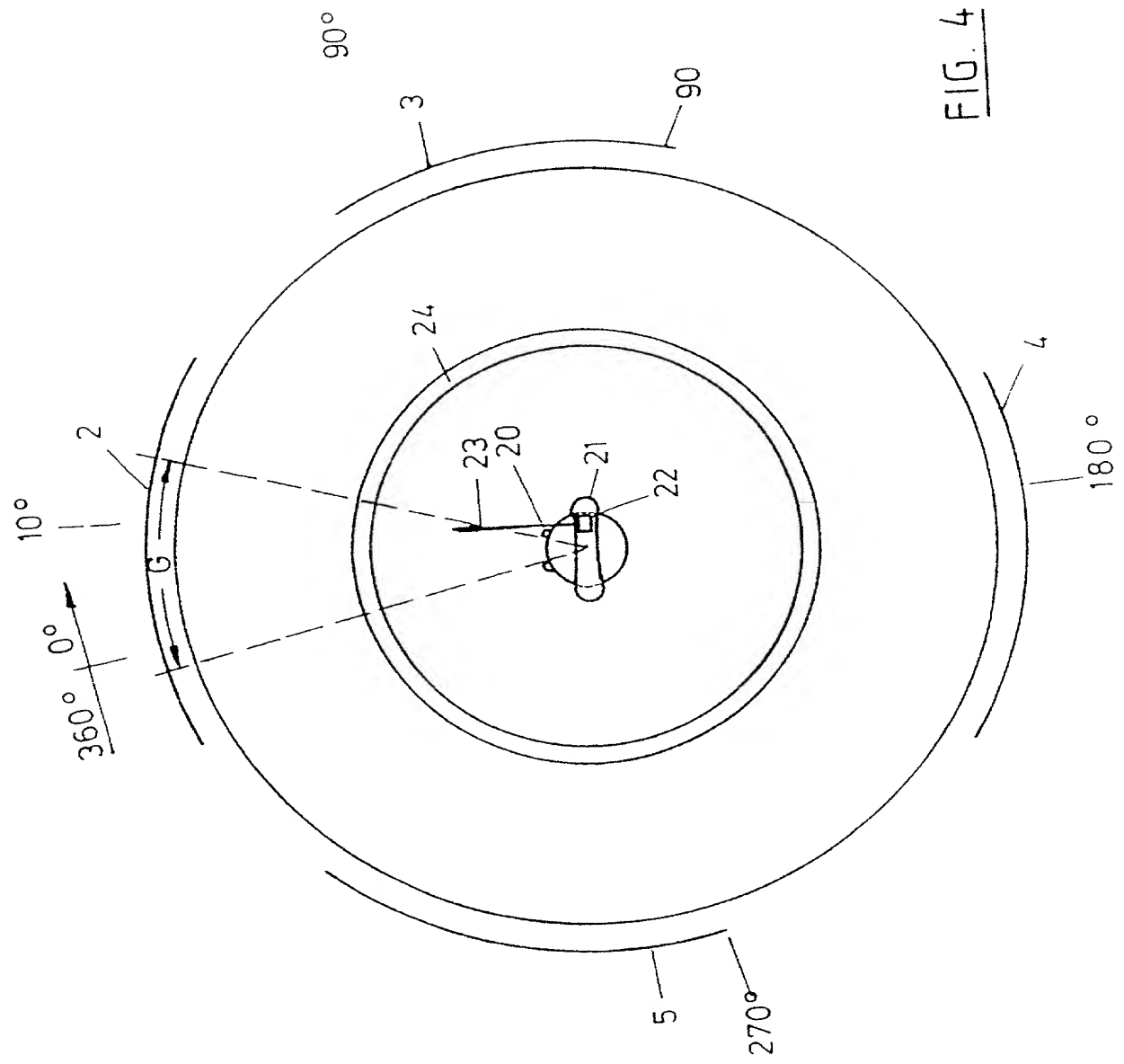


FIG. 4

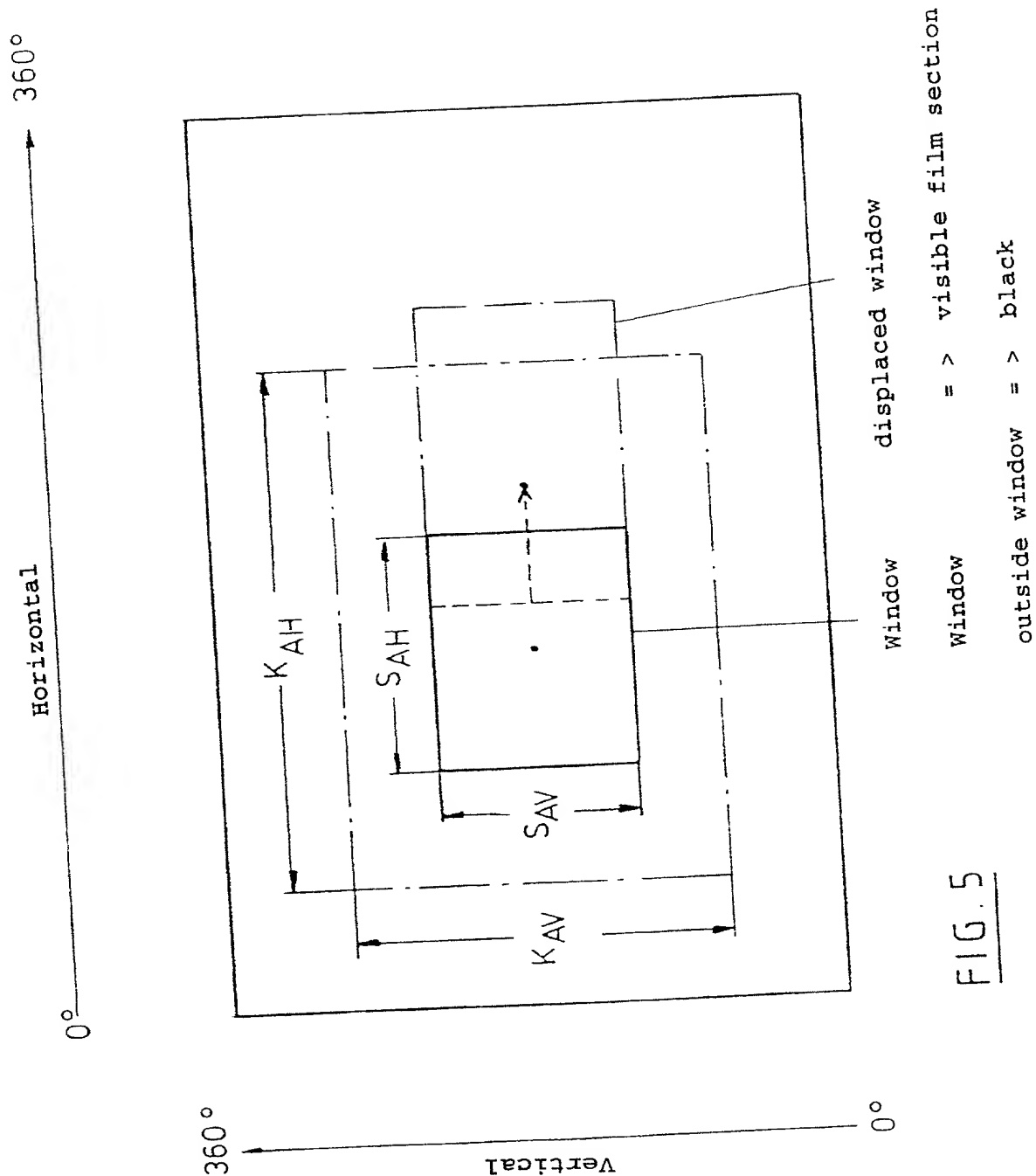
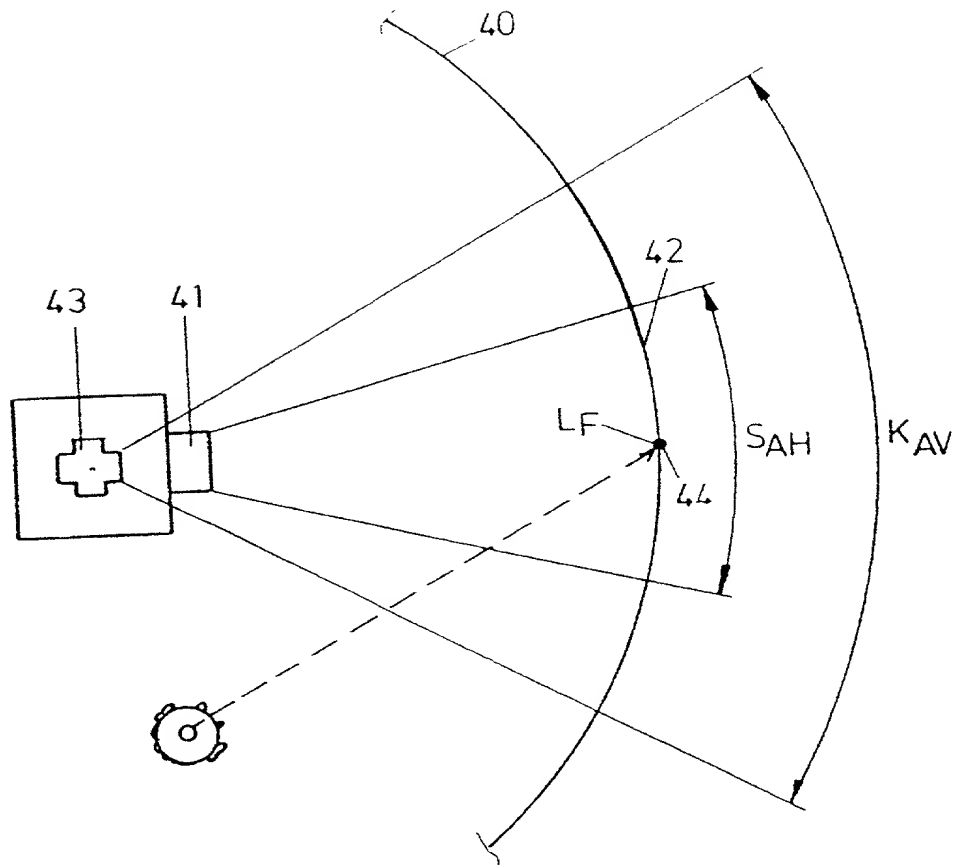


FIG. 5

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FIG. 6

$LF$  = Light spot  
 $SAH$  = Film section  
           width (horizontal)  
           (window width)  
 $K_{AV}$  = camera section  
          (horizontal)

JCO2 Rec' 77/PTO 25 APR 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No.: 18390.4

Assistant Commissioner for Patents  
Washington, DC 20231  
U.S.A.

Dear Sir:

Please enter this amendment prior to calculation of the filing fees. This amendment is based on the translation of the application **as filed** on October 26, 1999.

IN THE SPECIFICATION:

On page 1, insert as a title prior to the first paragraph --  
BACKGROUND OF THE INVENTION --.

On page 2, replace the second to last paragraph as follows --

The object in accordance with the invention is achieved by a method in accordance with the independent claims. Advantageous further developments are given in the dependent claims. --.

On page 2, insert as a title prior to the last paragraph -- SUMMARY OF THE INVENTION --.

On page 7, please insert as a title prior to the brief description of the drawings --

BRIEF DESCRIPTION OF THE DRAWING --.

On page 7 insert as a title following the brief description of the drawings --

DESCRIPTION OF THE PREFERRED EMBODIMENT --.

On page 15, line 1, replace as a title "Claims" with -- I CLAIM: --.

IN THE CLAIMS:

Please delete claims 1 - 27 without prejudice and enter new claims 28 - 54 as indicated below:



28. A method for interactive audio/visual reproduction of a film, the film having a plurality of scenes, the film also having a width and a height, the method comprising the steps of:

- a) defining a visible section of the film, said visible section having a section width which is less than the film width, said visible section also having a section height which is less than the film height;
- b) controlling, by means of a viewer, a position of said visible section within said film; and
- c) replaying audio information which does not belong to said visible section.

29. The method of claim 28, further comprising at least one of emphasizing and amplifying audio information which belongs to said visible film section.

30. The method of claim 28, wherein said position of said visible section of the film depends on a viewing direction of the viewer.

31. A method for interactive replay of a panoramic film, the panoramic film having a width and a height, the method comprising the steps of:

- a) defining, with a user, a viewed section of the film, said viewed section having at least one of a section width which is less than the film width and a section height which is less than the film height;
- b) detecting, with an orientation device, said viewed section;
- c) emphasizing said viewed section, in at least one of an audio and a visual manner, compared to other film sections not currently viewed by the user, and
- d) replaying said emphasized viewed section following step c).

32. The method of claim 31, wherein visual emphasis is realized within a replay window, wherein film sections outside of said replay window are one of not replayed and barely visible.
33. The method of claim 32, wherein said replay window has a shape which is one of square and round.
34. The method of claim 31, wherein the film is replayed on a screen which surrounds the user through up to 360° in a vertical and horizontal direction.

35. The method of claim 31, wherein individual scenes of the film are recorded at one single camera position within a range of up to 360° about said camera position.
36. The method of claim 31, wherein said orientation device comprises first means for emitting a signal and second means for receiving said emitted signal, said orientation device further comprising means for evaluating an orientation of said signal to control emphasis of replay of said viewed section.
37. The method of claim 31, wherein said orientation device is mounted to at least one of a user head, an acoustical reproduction device worn by the user, and a headphones worn by the user.
38. The method of claim 31, wherein said orientation device comprises a magnetic field generator and a magnetic field measuring device, wherein said magnetic field measuring device determines an orientation of a magnetic field generated by said magnetic field generator.
39. The method of claim 31, wherein said orientation device comprises means for generating and receiving one of an electromagnetic wave, a light wave, a non-visible light wave, and an infrared wave.

40. The method of claim 39, wherein said means for generating the electromagnetic wave is an infrared laser and said means for receiving the electromagnetic wave comprises a camera which can detect an infrared light spot impinging on a screen and which can follow a changing direction thereof.
41. The method of claim 31, further comprising an additional orientation device for each of a plurality of users.
42. The method of claim 31, wherein said emphasis of said viewed section is achieved in that acoustical information which belongs to said viewed section is amplified more during replay than is acoustical information which does not belong to said viewed section.
43. The method of claim 31, wherein visual emphasis of said viewed section is achieved during replay by replaying said viewed section on a screen with a highest possible sharpness.
44. The method of claim 31, wherein for replay of the film, a projector is provided which is at least one of mechanically coupled, electronically coupled and controlled by a part of said orientation device detecting a viewing direction.

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45. The method of claim 31, further comprising means carried by the user which emit a light beam for transmitting a signal, wherein said orientation device detects the emitted light beam or a reflection thereof and controls a projector such that said light beam or a light spot of said light beam is centered on said replayed viewed section.
46. The method of claim 31, wherein a position of said viewed section is determined through superposition of several individual light spots or light beams emitted from different positions of users.
47. The method of claim 31, further comprising several orientation units for making a majority decision about said viewed section by constructing a geometric average of directions determined by all of said several orientation units.
48. The method of claim 31, wherein at least one of a shape and a size of said viewed section can be individually adjusted.
49. The method of claim 31, wherein said visible section is controlled by a computer.

50. A film reproduction unit for interactive replay of a panoramic film, the panoramic film having a width and a height, the method comprising:

- a) means for defining, with a user, a viewed section of the film, said viewed section having at least one of a section width which is less than the film width and a section height which is less than the film height;
- b) means for detecting, with an orientation device, said viewed section;
- c) means for emphasizing said viewed section, in at least one of an audio and visual manner, compared to other film sections not currently viewed by the user, and
- d) means for replaying said emphasized viewed section following step c).

51. A cinema comprising the film reproduction unit of claim 50.

52. The cinema of claim 51, wherein one of a hemispherical and a spherical dome is provided as a projection surface to permit panoramic film replay in one of up to 360° and in all directions.

53. The cinema of claim 51, wherein each visitor wears one of an individual sound replay unit and headphones.

54. A method for the production of a panoramic film the method comprising the steps of:

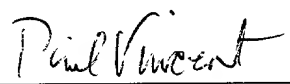
- a) recording, using a camera means, an image which is considerably larger than a usual visual viewing section and which can be detected by a human eye with sufficient sharpness; and
- b) associating, using said camera means, directional information with acoustical signals which are correlated with a certain scene of a film panorama.

REMARKS

The amendments have been taken to adapt this application to United States practice. No new matter has been added.

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Dr. Paul Vincent  
Agent for the Applicant  
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09/830299

J003 Rec'd PCT/PTO 25 APR 2001

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	SHAW, Jeffrey	) Examiner:
PCT Application No.:	PCT/EP99/08078	) unknown
PCT Filing Date:	October 26, 1999	) Art Unit:
For:	INTERACTIVE FILM	) unknown
	REPRODUCTION	)

Docket No.: 18390.4

Assistant Commissioner for Patents  
Washington, DC 20231  
U.S.A.

PRELIMINARY AMENDMENT

Dear Sir:

Please enter this amendment prior to calculation of the filing fees. This amendment is based on the translation of the application **as filed** on October 26, 1999.

IN THE SPECIFICATION:

On page 1, insert as a title prior to the first paragraph --  
BACKGROUND OF THE INVENTION --.

On page 2, replace the second to last paragraph as follows --

09/830299, 04/25/01  
PCT/EP 99/08078



The object in accordance with the invention is achieved by a method in accordance with the independent claims.  
 Advantageous further developments are given in the dependent claims. --.

On page 2, insert as a title prior to the last paragraph --  
 SUMMARY OF THE INVENTION --.

On page 7, please insert as a title prior to the brief  
 description of the drawings --

BRIEF DESCRIPTION OF THE DRAWING --.

On page 7 insert as a title following the brief description  
 of the drawings --

DESCRIPTION OF THE PREFERRED EMBODIMENT --.

On page 15, line 1, replace as a title "Claims" with --  
 I CLAIM: --.

IN THE CLAIMS:

Please delete claims 1 - 27 without prejudice and enter  
 new claims 28 - 54 as indicated below:

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- a) defining a visible section of the film, said visible section having a section width which is less than the film width, said visible section also having a section height which is less than the film height;
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- a) defining, with a user, a viewed section of the film, said viewed section having at least one of a section width which is less than the film width and a section height which is less than the film height;
- b) detecting, with an orientation device, said viewed section;
- c) emphasizing said viewed section, in at least one of an audio and a visual manner, compared to other film sections not currently viewed by the user, and
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- 33. The method of claim 32, wherein said replay window has a shape which is one of square and round.
- 34. The method of claim 31, wherein the film is replayed on a screen which surrounds the user through up to 360° in a vertical and horizontal direction.

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36. The method of claim 31, wherein said orientation device comprises first means for emitting a signal and second means for receiving said emitted signal, said orientation device further comprising means for evaluating an orientation of said signal to control emphasis of replay of said viewed section.
37. The method of claim 31, wherein said orientation device is mounted to at least one of a user head, an acoustical reproduction device worn by the user, and a headphones worn by the user.
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40. The method of claim 39, wherein said means for generating the electromagnetic wave is an infrared laser and said means for receiving the electromagnetic wave comprises a camera which can detect an infrared light spot impinging on a screen and which can follow a changing direction thereof.
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43. The method of claim 31, wherein visual emphasis of said viewed section is achieved during replay by replaying said viewed section on a screen with a highest possible sharpness.
44. The method of claim 31, wherein for replay of the film, a projector is provided which is at least one of mechanically coupled, electronically coupled and controlled by a part of said orientation device detecting a viewing direction.

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45. The method of claim 31, further comprising means carried by the user which emit a light beam for transmitting a signal, wherein said orientation device detects the emitted light beam or a reflection thereof and controls a projector such that said light beam or a light spot of said light beam is centered on said replayed viewed section.
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47. The method of claim 31, further comprising several orientation units for making a majority decision about said viewed section by constructing a geometric average of directions determined by all of said several orientation units.
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- b) means for detecting, with an orientation device, said viewed section;
- c) means for emphasizing said viewed section, in at least one of an audio and visual manner, compared to other film sections not currently viewed by the user, and
- d) means for replaying said emphasized viewed section following step c).

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52. The cinema of claim 51, wherein one of a hemispherical and a spherical dome is provided as a projection surface to permit panoramic film replay in one of up to 360° and in all directions.

54. A method for the production of a panoramic film the method comprising the steps of:

- a) recording, using a camera means, an image which is considerably larger than a usual visual viewing section and which can be detected by a human eye with sufficient sharpness; and
- b) associating, using said camera means, directional information with acoustical signals which are correlated with a certain scene of a film panorama.

The amendments have been taken to adapt this application to United States practice. No new matter has been added.

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Dr. Paul Vincent  
Agent for the Applicant  
Registration No. 37,461



COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY  
(Includes Reference to PCT International Applications)

ATTORNEY DOCKET NUMBER  
18390.4/01

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

INTERACTIVE FILM REPRODUCTION

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No. \_\_\_\_\_

on \_\_\_\_\_

and was amended

on \_\_\_\_\_ (if applicable)

☒ was filed as PCT international application  
PCT/EP99/08078

Number \_\_\_\_\_

on October 26, 1999

and was amended under PCT Article 19

on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me or other person(s) involved in the preparation or prosecution of this application to be material to the examination of this application and to patentability as defined in Title 37, Code of Federal Regulations, §1.56

I hereby authorize the U.S. attorney or agent named herein to accept and follow instructions from \_\_\_\_\_

as to any action taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day month year)	PRIORITY CLAIMED UNDER 35 USC 119	
Germany	198 49 269.3	26. October 1998	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO

**\*Combined Declaration For Patent Application and Power of Attorney (Continued)**

(Includes Reference to PCT International Applications)

ATTORNEY DOCKET NUMBER

18390.4/01

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**• PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. BENEFIT UNDER 35 U.S.C. 120****U.S. APPLICATIONS****STATUS (Check one)**

U.S. APPLICATION NUMBER

U.S. FILING DATE

PATENTED

PENDING

ABANDONED

**PCT APPLICATIONS DESIGNATING THE U.S.**

PCT APPLICATION NUMBER

PCT FILING DATE

U.S. SERIAL NUMBERS  
ASSIGNED (if any)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Paul J. Vincent Reg. No. 37,461

Send Correspondence to:

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201	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
202	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare under penalty of perjury under the laws of the United States of America that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon

SIGNATURE OF INVENTOR 201

SIGNATURE OF INVENTOR 202

SIGNATURE OF INVENTOR 203

DATE

DATE

DATE

April 20, 2001